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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,480	12/30/2003	Robert F. Mortan	TI-36812 (032350.B572)	8732
23494	7590	08/11/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			HOANG, QUOC DINH	
			ART UNIT	PAPER NUMBER

2818

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/748,480	MORTAN, ROBERT F.	
	Examiner	Art Unit	
	Quoc D. Hoang	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12, 13, 16, 17, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12, 13, 16, 17, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Amendment filed on 06/01/2006 has been entered. In Amendment, claims 1-11, 14, 15 and 18-20 have been cancelled. Claims 12, 13, 16, 17, 21 and 22 are pending in the application.

Allowable Subject Matter

2. The indicated allowability of claim 12 is withdrawn in view of the newly discovered reference(s) to Heo. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12, 13, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto., (US Pat No. 5,640,052) in view of Heo., (US Pat No. 6,091,141).

Regarding claim 12, Tsukamoto teaches a circuit board assembly comprising:
a circuit board (substrate) 2 comprising a board pad (substrate pad) 6 (col. 3, lines 5-15 and Fig. 1);

a component package (chip) 1, comprising a terminal with a planar base 5 aligned with the board pad 6 (col. 3, lines 5-15 and Fig. 1).

the terminal including a elongated member (core) 4, having an outer surface and a cross section area extending from the terminal base 5 (col. 3, lines 20-26 and Fig. 1); and

a solder 3 deposit having a hourglass shape, covering the pad 6 and the outer surface of the elongated member 4 (col. 3, lines 20-26 and Fig. 1).

Tsukamoto teaches the elongated member (core) 4, but does not teach the elongated member including a J-hook shaped.

However, Heo teaches solder (27) having elongated member (tail) 23 including a J-hook shaped (col. 4, lines 62-67 and Fig. 2A). Since Tsukamoto and Heo are all from the same field of endeavor, the purpose disclosed by Heo would have been recognized in the pertinent art of Tsukamoto. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide a J-hook shaped core in the solder in order to achieve compactness, smallness, lightness and thinness of the semiconductor package as taught by Heo, column 5, lines 15-18.

Regarding claim 13, Tsukamoto teaches wherein the pad 6 has a surface area greater than the cross section area of the elongated member 4 (col. 3, lines 13-15, lines 50-56, Figs. 2a-2c).

Regarding claim 21, Tsukamoto teaches the solder deposit 3 has a length L6 is approximately the length ($L2 + L3$) of the elongated member 4 (col. 3, lines 30-65, Figs. 2a-2b).

Regarding claim 22, Tsukamoto teaches the cross section of the solder deposit 3 along its length L5 is smaller than the planar base area of the terminal 5 (col. 3, lines 1-5, lines 40-45 and Fig. 2b).

5. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto (US Pat No. 5,640,052) and Heo., (US Pat No. 6,091,141) as applied to claim 12 above, and further in view of Inatsugu (US Pat No. 6,821,820).

Regarding claim 16, Tilly teaches the component or chip package 20 (col. 3, lines 24-26, lines 57-65 and Fig. 3), but does not teach wherein the component package comprises a Quad Flat No-lead (QFN) package.

However, Inatsugu teaches wherein the component package comprises a Quad Flat No-lead (QFN) package (col. 11 lines 48-60). Since Tilly and Inatsugu are all from the same field of endeavor, the purpose disclosed by Inatsugu would have been recognized in the pertinent art of Tilly. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the component package comprises a Quad Flat No-lead (QFN) package so that the anchor effect can be achieved and thus the coming off of the lead portion from the molding resin can be presented in as taught by Inatsugu, column 11, lines 55-60.

Regarding claim 17, Tilly teaches the component or chip package 20 (col. 3, lines 24-26, lines 57-65 and Fig. 3), but does not teach wherein the component package comprises a Small Outline No-lead (SON) package.

However, Inatsugu teaches wherein the component package comprises a Small Outline No-lead (SON) package (col. 11 lines 48-60). Since Tilly and Inatsugu are all

from the same field of endeavor, the purpose disclosed by Inatsugu would have been recognized in the pertinent art of Tilly. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the component package comprises a Small Outline No-lead (SON) package so that the anchor effect can be achieved and thus the coming off of the lead portion from the molding resin can be presented in as taught by Inatsugu, column 11, lines 55-60.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

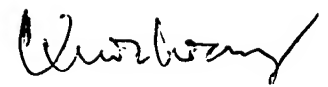
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Quoc Hoang

Patent examiner/AU 2818

A handwritten signature in black ink, appearing to read "Quoc Hoang".

08/05/2006